

REMARKS/ARGUMENTS

Claims 1-10 are pending. By this Amendment, claims 1-5 and 8-10 are amended. Support for the amendments to claims 1-5 and 8-10 can be found, for example, in original claims 1-5 and 8-10. The amendments to claims 1-5 and 8-10 are made solely to improve the clarity of those claims. No new matter is added. In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

Allowable Subject Matter

Applicants thank the Examiner for the indication in the Office Action that claims 2-4 recite allowable subject matter.

Rejection Under 35 U.S.C. §112, Second Paragraph

The Office Action rejects claims 8-10 as indefinite under 35 U.S.C. §112, second paragraph. Applicants respectfully traverse the rejection.

As correctly pointed out in the Office Action, claims 8-10 are product-by-process claims in which at least one solid material is formed by pulsed laser deposition. *See* Office Action, page 3. However, the Office Action fails to state any reason why such claims should not be permitted. In fact, the Office Action identifies precedent indicating that such claims are permissible. *See* Office Action, page 3. Absent further explanation, Applicants submit that the rejection is improper.

For the foregoing reasons, claims 8-10 are definite. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Rejections Under 35 U.S.C. §103

A. Nishimura and Cauro

The Office Action rejects claims 1 and 6 under 35 U.S.C. §103(a) over JP 2001-320108 to Nishimura ("Nishimura") in view of Cauro et al. (Persistent and transient photoconductivity in oxygen-deficient La₂/3Sr₁/3MoO_{3-δ} thin films) ("Cauro"). Applicants respectfully traverse the rejection.

Claim 1 recites "[a] tunnel junction device, comprising: a first electrode; a second electrode; and an electrically insulating layer arranged between the first electrode and the second electrode; wherein: the first electrode comprises an A_{1-x}B_xM_{1-y}M'_yO_{3-δ} oxide ... and the second electrode comprises an A_{1-x'}B_{x'}M_{1-y'}M'_{y'}O_{3-δ} oxide ... having a component ratio y' that is not equal to y, wherein x' and y' satisfy the conditions: 0<x'≤1, 0<y'≤1" (emphasis added). Nishimura and Cauro fail to disclose or suggest such a tunnel junction device.

The Office Action asserts that Nishimura discloses a tunnel junction device including a first electrode 210, a second electrode 240, and an electrically insulating layer 250 formed therebetween. *See* Office Action, page 4. Nishimura does, indeed, disclose a structure including LaSrMnO₃ magnetic layer 210, an SrTiO₃ insulating layer 250 and a further LaSrMnO₃ magnetic layer 240. *See, e.g., Nishimura*, paragraph [0022]; FIG. 2. However, the magnetic layers 210 and 240 have the same composition. As is plain from the highlighted language of claim 1 set forth above, the composition of the first electrode and the second electrode of the claimed tunnel junction device have different compositions.

As discussed in the present specification, the present inventors discovered that it is possible to control the spin retentions of upper and lower ferromagnetic electrodes by providing two electrodes formed from perovskite ferromagnetic (including ferrimagnetic) electroconductive oxides containing a plurality of different transition metal elements and having different compositions. *See, e.g.,* present specification, page 8, lines 6 to 12.

Nishimura fails to disclose or suggest such a configuration, or recognize the benefits stemming therefrom.

For the reasons discussed above, Nishimura fails to disclose or suggest each and every feature of claim 1. Cauro does not remedy the deficiencies of Nishimura. Cauro is cited for its alleged disclosure of a perovskite having an oxygen deficiency. *See* Office Action, page 5. However, Cauro, like Nishimura fails to disclose or suggest a tunnel junction device including a first electrode and a second electrode having the different compositions recited in claim 1. Accordingly, the combination of references fails to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Nishimura and Cauro. Claim 6 depends from claim 1 and, thus, also would not have been rendered obvious by Nishimura and Cauro. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Nishimura, Cauro and Baum

The Office Action rejects claim 5 under 35 U.S.C. §103(a) over Nishimura in view of Cauro and U.S. Patent No. 6,117,571 to Baum et al. ("Baum"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Nishimura and Cauro fail to disclose or suggest each and every feature of claim 1. Baum does not remedy the deficiencies of Nishimura and Cauro. Baum is cited for its alleged disclosure of an LaMnO₃ insulating layer. *See* Office Action, page 5. However, Baum, like Nishimura and Cauro, fails to disclose or suggest a tunnel junction device including a first electrode and a second electrode having the different compositions recited in claim 1. Accordingly, the combination of references fails to disclose or suggest each and every feature of claim 1.

As explained, claim 5 would not have been rendered obvious by Nishimura, Cauro and Baum. Claim 5 depends from claim 1 and, thus, also would not have been rendered obvious by Nishimura, Cauro and Baum. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

C. Nishimura, Cauro and Saito

The Office Action rejects claim 7 under 35 U.S.C. §103(a) over Nishimura in view of Cauro and U.S. Patent No. 6,556,473 to Saito et al. ("Saito"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Nishimura and Cauro fail to disclose or suggest each and every feature of claim 1. Saito does not remedy the deficiencies of Nishimura and Cauro. Saito is cited for its alleged disclosure of an LaAlO₃ tunnel barrier layer. *See* Office Action, page 6. However, Saito, like Nishimura and Cauro, fails to disclose or suggest a tunnel junction device including a first electrode and a second electrode having the different compositions recited in claim 1. Accordingly, the combination of references fails to disclose or suggest each and every feature of claim 1.

As explained, claim 7 would not have been rendered obvious by Nishimura, Cauro and Baum. Claim 7 depends from claim 1 and, thus, also would not have been rendered obvious by Nishimura, Cauro and Baum. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

D. Nishimura, Cauro and Hsu

The Office Action rejects claim 8 under 35 U.S.C. §103(a) over Nishimura in view of Cauro and U.S. Patent Application Publication No. 2003/0001178 to Hsu et al. ("Hsu"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Nishimura and Cauro fail to disclose or suggest each and every feature of claim 1. Hsu does not remedy the deficiencies of Nishimura and Cauro. Hsu is cited for its alleged disclosure of an depositing a perovskite material by pulsed laser deposition. *See* Office Action, page 7. However, Hsu, like Nishimura and Cauro, fails to disclose or suggest a tunnel junction device including a first electrode and a second electrode having the different compositions recited in claim 1. Accordingly, the combination of references fails to disclose or suggest each and every feature of claim 1.

As explained, claim 8 would not have been rendered obvious by Nishimura, Cauro and Hsu. Claim 8 depends from claim 1 and, thus, also would not have been rendered obvious by Nishimura, Cauro and Hsu. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Double Patenting

The Office Action provisionally rejects claim 1 of the present application under the judicially created doctrine of obviousness-type double patenting over claim 1 of U.S. Patent Application No. 10/569,089. Applicants submit that the Terminal Disclaimer filed herewith obviates the rejection. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

For the foregoing reasons, Applicants submit that claims 1-10 are in condition for allowance. Prompt reconsideration and allowance are respectfully requested.

Respectfully submitted,

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Terminal Disclaimer